

Serial No. 10/815,728

KY-198

Amendment filed May 29, 2007

Response to Final Office Action mailed January 29, 2007

**REMARKS****Pending Claims**

Claims 1-20 are pending in this application. Claims 1 and 9 have been canceled without prejudice or disclaimer. Claims 2, 5, 7, 10, 13, 15, 16 and 20 have been amended. No new matter has been added.

**Claim Rejections under 35 U.S.C. §102**

Claims 2-3, 10-11 and 16-18 have been rejected under 35 U.S.C. §102(b) as being anticipated by Hagen et al., U.S. Publication No. 2002/0154298 A1 (hereinafter Hagen).

**Claim Rejections under 35 U.S.C. § 103**

Claims 4-8, 12-15 and 19-20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hagen, in view of Brunfeld et al. (hereinafter Brunfeld), U.S. Patent No. 6,294,793 and Dotan, U.S. Patent No. 5,355,213. Claims 7-8 and 15 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hagen, Brunfeld and Dotan as applied to claims 2-6 and 10-14 and further in view of Yoshiyama et al., U.S. Patent No. 6,078,385. Applicants request reconsideration of the rejections for the following reasons.

Applicants have amended independent claims 2, 10 and 16 to set forth that which the Applicants regard as the invention. In particular, each of these claims is amended to set forth that the light receiving system has a light receiving plane of an optical fiber for receiving the

Serial No. 10/815,728

KY-198

Amendment filed May 29, 2007

Response to Final Office Action mailed January 29, 2007

scattered light. The amendment is made in response to the Office Action, and in particular to the Response to Arguments section of the Office Action on pages 4 and 5. Applicants have taken the position that Hagen does not teach a light receiving system for receiving scattered light, however the examiner found the argument to not be persuasive. According to the Office Action, Hagen teaches that the reflecting light rays strike an anomaly, such as a crack or chip in an edge surface of the disk, and the light ray is diffused. The Office Action further states that diffused light is scattered light by definition, and therefore the rejection is deemed proper.

Applicants disagree with the interpretation given to Hagen, however, for the following reasons. The scattered light receiving system of the present invention does not have a lens, but rather a light receiving plane of an optical fiber for receiving the scattered light which is scattered by a defect in the inspection region. Therefore, the scattered light receiving system does not receive an image in the present invention. Further, there is no camera or other means for forming an image of an object via a lens and focusing system in the present invention, for example, and there can be no image constructed with the scattered light unless a lens is present.

The scattered light receiving system of the present invention is arranged such that a line normal to the light receiving plane thereof makes an angle  $\theta_j$  with respect to an inspection region (detected position S) of the outer peripheral side surface of the disk. Therefore, the scattered light receiving system generates a detection signal by a light receiver that receives the scattered light via the optical fiber, which has a light receiving plane. The angle  $\theta_j$  is about  $40^\circ$  with respect to the surface of the disk 1 in a preferred embodiment of the invention, however the angle may be provided over a range such that the scattered light from the chamfered

Serial No. 10/815,728

KY-198

Amendment filed May 29, 2007

Response to Final Office Action mailed January 29, 2007

portions and the outer peripheral side surface can be received with the light receiving plane.

See page 7, last five lines to page 8, line 11; page 12, last six lines to page 13, line 17; and page 14, lines 6-14 of the Specification.

Referring to Hagen, there is a first light receiving system that receives diffused light from the inspection region, but the diffused light that is generated is not generated by an illumination system for illuminating a light beam to an inspected region of an edge portion of a disk through an inside portion of the disk by directing the light beam at a predetermined incident angle with respect to the peripheral surface of the disk to be inspected, as in the present invention. Hagen discloses a CCD camera 22 with a lens 26 that is part of a very high-speed digital camera. The camera 22 records the relative light intensity for each pixel of an image in order to record the respective illumination intensity values of the pixels. On the other hand, the light receiving system of the present invention receives scattered light from the inspected region of the disk, which is rotating, and has a light receiving plane of an optical fiber for receiving the scattered light. Accordingly, the rejection under 35 U.S.C. §102(b), should be withdrawn.

Brunfeld is relied upon for teaching the use of a plurality of light receiving systems for defecting the defects at the edge of and/or within a glass disk. Brunfeld discloses CCD cameras that receive an image of beveled edges 108, 110 and a flat edge 109 (and beveled edges 112, 114 and a flat edge 113) of the disk 74. Brunfeld discloses that the "image of the edge 110 and a half of edge 109 of the transparent disk 74 to be inspected is focused by a lens 134 of the camera 132 onto the linear CCD array 136." See column 9, lines 30 – 33 of the reference and

Serial No. 10/815,728

KY-198

Amendment filed May 29, 2007

Response to Final Office Action mailed January 29, 2007

## Figure 7.

As shown in Brunfeld, the four CCD cameras 116, 118, 120 and 122 are set at positions according to a beveled edge and a flat edge and the cameras each have a lens for receiving the light from a defect in this inspection region that is imaged. There is no disclosure of making an angle with respect to the inspection region, such as  $\theta_j$  (Fig. 3(a)) in the present invention. Further, the reference does not disclose a light receiving plane of an optical fiber for receiving scattered light. Accordingly, Brunfeld does not overcome the deficiencies in Hagen noted in the foregoing discussion of the reference.

Dotan is relied upon for disclosing a light source which is a laser. However, none of the elements of the system in Dotan overcome the deficiencies noted with respect to Hagen and Brunfeld. Dotan discloses receiving radiation leaving the surface 1a via a lens 9 that is located opposite to the surface 1a to be imaged. The CCD camera 8 does not receive scattered light from an inspection region, however.

Claims 4-8, 12-15 and 19-20 set forth a second light receiving system that receives scattered light propagating within the disk from the inspection region and emitted externally of the disk from a position that is offset by a predetermined distance from the position of the outer peripheral side surface symmetrical to the incident position of the spot in the outer peripheral side surface about a diameter line of the disk passing through the inspection region. Hagen does not disclose receiving scattered light propagating within the disk from the inspection region. The CCD camera 22 of Hagen is not located such that scattered light propagating within the disk from the inspection region that is emitted externally of the disk would be

Serial No. 10/815,728

KY-198

Amendment filed May 29, 2007

Response to Final Office Action mailed January 29, 2007

received by the camera. Further, the projection optics of Brunfeld is not disclosed to be incident to the outer peripheral surface of a disk being inspected, but is rather incident to the inner peripheral surface of the disk. See Figures 6 and 6A of Brunfeld.

Further, Dotan does not meet the requirements of claims 4-8, 12-15 and 19-20 with respect to the second light receiving system provided externally of the disk, and therefore the combination of Hagen, Brunfeld and Dotan does not render these claims obvious under 35 U.S.C. §103. Accordingly, the rejection should be withdrawn.

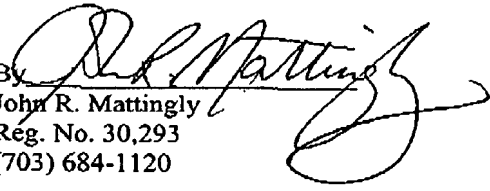
Yoshiyama et al is applied with respect to dependent claims 7-8 and 15, however, each of these claims is patentable at least for depending from a base claim, which has been asserted to be allowable for the foregoing reasons. Accordingly, the rejection of claims 7-8 and 15 under 35 U.S.C. § 103 should be withdrawn.

### Conclusion

In view of the foregoing, Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.

By   
John R. Mattingly  
Reg. No. 30,293  
(703) 684-1120

Date: May 29, 2007